

Based on the grounds set forth in said announcements and the firm's responses, the Commissioner of Food and Drugs concludes that the antibiotic applications for the above-named products should be withdrawn. Therefore, pursuant to provisions of the Federal Food, Drug, and Cosmetic Act (sec. 512, 82 Stat. 343-51; 21 U.S.C. 360b) and under the authority delegated to the Commissioner (21 CFR 2.120), approval of the antibiotic applications for the above products is hereby withdrawn effective on the date of publication of this document.

Dated: March 13, 1972.

SAM D. FINE,
Associate Commissioner
for Compliance.

[FR Doc.72-4257 Filed 3-20-72;8:47 am]

DEPARTMENT OF TRANSPORTATION

Coast Guard

[CGD 72-56N]

ELIZABETH RIVER, NORFOLK HARBOR, VA.

Security Zone

By virtue of the authority vested in the Commandant, U.S. Coast Guard, by Executive Order 10173, as amended (33 CFR Part 6), section 6(b)(1), 80 Stat. 937, 49 U.S.C. 1655(b)(1), 49 CFR 1.46(b) and the redelegation of authority to the Chief, Office of Marine Environment and Systems, U.S. Coast Guard Headquarters as contained in the FEDERAL REGISTER of September 30, 1971 (36 F.R. 19160), I hereby affirm for publication in the FEDERAL REGISTER the order of H. E. Steel, Captain, U.S. Coast Guard, Captain of the Port, Hampton Roads Area, who has exercised authority as Captain of the Port, such order reading as follows:

PORTION OF THE ELIZABETH RIVER, NORFOLK HARBOR, VIRGINIA CLOSED TO NAVIGATION DURING TRANSIT OF THE USS AMERICA

SECURITY ZONE

Under the present authority of section 1 of Title II of the Espionage Act of June 15, 1917, 40 Stat. 220, as amended, 50 U.S.C. 191, Executive Order 10173, as amended, I declare that from 0800R 27 March 1972 until 1030R 27 March 1972, the following area is a Security Zone and I order it be closed to any person or vessel due to transit of the U.S.S. America.

The waters of the Elizabeth River, Norfolk Harbor, Va., within the area between Elizabeth River Channel lighted buoy 14 LL 2952 at latitude 36°55'08" north and the Norfolk and Portsmouth Beltline Railroad Bridge which crosses the southern branch of the Elizabeth River at latitude 36°48'41" north.

No person or vessel shall remain in or enter this security zone without permission of the Captain of the Port, 393 9611, Ext. 220.

The Captain of the Port, Hampton Roads Area, shall enforce this order. In the en-

forcement of this order, the Captain of the Port may utilize, by appropriate agreement, personnel and facilities of any other Federal agency, or of any state or political subdivision thereof.

For violation of this order, section 2 of title II of the Espionage Act of June 15, 1917 (40 Stat. 220 as amended, 50 U.S.C. 192), provides:

If any owner, agent, master, officer, or person in charge, or any member of the crew of any such vessel fails to comply with any regulation or rule issued or order given under the provisions of this chapter, or obstructs or interferes with the exercise of any power conferred by this chapter, the vessel, together with her tackle, apparel, furniture, and equipment, shall be subject to seizure and forfeiture to the United States in the same manner as merchandise is forfeited for violation of the customs revenue laws; and the person guilty of such failure, obstruction, or interference shall be punished by imprisonment for not more than 10 years and may, in the discretion of the court, be fined not more than \$10,000.

(a) If any other person knowingly fails to comply with any regulation or rule issued or order given under the provisions of this chapter, or knowingly obstructs or interferes with the exercise of any power conferred by this chapter, he shall be punished by imprisonment for not more than 10 years and may, at the discretion of the court, be fined not more than \$10,000.

Dated: March 17, 1972.

J. M. AUSTIN,
Captain, U.S. Coast Guard, Acting
Chief, Office of Marine
Environment and Systems.

[FR Doc.72-4371 Filed 3-20-72;9:05 am]

CIVIL AERONAUTICS BOARD

[Docket No. 24283, etc.]

AIR CARRIER REORGANIZATION INVESTIGATION

Notice of Prehearing Conference

Notice is hereby given that a prehearing conference in the above entitled matter is assigned to be held on May 10, 1972, at 10 a.m., local time, in Room 726, Universal Building, 1825 Connecticut Avenue NW., Washington, D.C., before Examiner E. Robert Seaver.

In order to facilitate the conduct of the conference parties are instructed to submit to the Examiner and other parties (1) proposed statements of issues; (2) proposed stipulations; (3) requests for information; (4) statement of positions of parties; and (5) proposed procedural dates. The Bureau of Operating Rights will circulate its material on or before April 25, 1972, and the other parties on or before May 5, 1972. The submissions of the other parties shall be limited to points on which they differ with the Bureau of Operating Rights.

Dated at Washington, D.C., March 14, 1972.

[SEAL] RALPH L. WISER,
Chief Examiner.

[FR Doc.72-4292 Filed 3-20-72;8:50 am]

[Docket No. 23954]

POLSKIE LINIE LOTNICZE "LOT" (POLISH AIRLINES)

Notice of Hearing Regarding Application for Foreign Air Carrier Permit Authorizing Service at New York, N.Y., or Chicago, Ill.

Notice is hereby given, pursuant to the provisions of the Federal Aviation Act of 1958, as amended, that a hearing in the above-entitled proceeding will be held on March 28, 1972, at 10 a.m., local time, in Room 805, Universal Building, 1825 Connecticut Avenue, NW., Washington, DC, before Examiner Merritt Ruhlen.

For information concerning the issues involved and other details in this proceeding, interested persons are referred to the prehearing conference report and other documents which are in the docket of this proceeding on file in the Docket Section of the Civil Aeronautics Board.

Dated at Washington, D.C., March 15, 1972.

[SEAL] MERRITT RUHLEN,
Hearing Examiner.

[FR Doc.72-4293 Filed 3-20-72;8:50 am]

[Docket No. 23073]

REA AIR FREIGHT FORWARDING, CONTROL, AND INTERLOCKING RELATIONSHIPS INVESTIGATION

Notice of Postponement of Hearing

Notice is hereby given, pursuant to the provisions of the Federal Aviation Act of 1958, as amended, that public hearing in the above-entitled matter now assigned to be held on March 20, 1972 (37 F.R. 3470, February 16, 1972), is hereby postponed due to serious illness in Examiner Newmann's family. A time and place for hearing in this proceeding will be designated by further notice.

Dated at Washington, D.C., March 16, 1972.

[SEAL] RALPH L. WISER,
Chief Examiner.

[FR Doc.72-4275 Filed 3-20-72;8:49 am]

CIVIL SERVICE COMMISSION

DEPARTMENT OF DEFENSE

Notice of Title Change in Noncareer Executive Assignment

By notice of March 9, 1968, F.R. Doc. 68-2898 the Civil Service Commission authorized the Department of Defense to fill by noncareer executive assignment the position of Assistant to the Assistant Secretary of Defense (International Security Affairs), Office of the Secretary of Defense. This is notice that the title of this position is now being changed to Assistant for POW/MIA and Economic Affairs, OASD (International Security

Affairs), Office of the Secretary of Defense.

UNITED STATES CIVIL SERVICE COMMISSION,
[SEAL] JAMES C. SPRY,
Executive Assistant to the Commissioners.

[FR Doc.72-4286 Filed 3-20-72; 8:49 am]

DEPARTMENT OF THE INTERIOR

Notice of Grant of Authority To Make Noncareer Executive Assignment

Under authority of § 9.20 of Civil Service Rule IX (5 CFR 9.20), the Civil Service Commission authorizes the Department of the Interior to fill by noncareer executive assignment in the excepted service the position of Associate Director, Office of Oil and Gas, Office of the Secretary, Office of the Assistant Secretary for Mineral Resources.

UNITED STATES CIVIL SERVICE COMMISSION,
[SEAL] JAMES C. SPRY,
Executive Assistant to the Commissioners.

[FR Doc.72-4283 Filed 3-20-72; 8:49 am]

DEPARTMENT OF THE INTERIOR

Notice of Grant of Authority To Make Noncareer Executive Assignment

Under authority of § 9.20 of Civil Service Rule IX (5 CFR 9.20), the Civil Service Commission authorizes the Department of the Interior to fill by noncareer executive assignment in the excepted service the position of Deputy Assistant Secretary, Mineral Resources (Energy Programs), Office of the Secretary.

UNITED STATES CIVIL SERVICE COMMISSION,
[SEAL] JAMES C. SPRY,
Executive Assistant to the Commissioners.

[FR Doc.72-4284 Filed 3-20-72; 8:49 am]

U.S. ARMS CONTROL AND DISARMAMENT AGENCY

Notice of Title Change in Noncareer Executive Assignment

By notice of June 5, 1970, F.R. Doc. 70-6997 the Civil Service Commission authorized the U.S. Arms Control and Disarmament Agency to fill by noncareer executive assignment the position of Deputy Assistant Director, Economic Bureau. This is notice that the title of this position is now being changed to Deputy Assistant Director, Economic Affairs Bureau.

UNITED STATES CIVIL SERVICE COMMISSION,
[SEAL] JAMES C. SPRY,
Executive Assistant to the Commissioners.

[FR Doc.72-4287 Filed 3-20-72; 8:49 am]

U.S. ARMS CONTROL AND DISARMAMENT AGENCY

Notice of Revocation of Authority To Make Noncareer Executive Assignment

Under authority of § 9.20 of Civil Service Rule IX (5 CFR 9.20), the Civil Service Commission revokes the authority of the U.S. Arms Control and Disarmament Agency to fill by noncareer executive assignment in the excepted service the position of Disarmament Adviser, Disarmament Advisory Staff.

UNITED STATES CIVIL SERVICE COMMISSION,
[SEAL] JAMES C. SPRY,
Executive Assistant to the Commissioners.

[FR Doc.72-4285 Filed 3-20-72; 8:49 am]

U.S. ARMS CONTROL AND DISARMAMENT AGENCY

Notice of Revocation of Authority To Make Noncareer Executive Assignment

Under authority of § 9.20 of Civil Service Rule IX (5 CFR 9.20), the Civil Service Commission revokes the authority of the U.S. Arms Control and Disarmament Agency to fill by noncareer executive assignment in the excepted service the position of Deputy Assistant Director, Economics Bureau.

UNITED STATES CIVIL SERVICE COMMISSION,
[SEAL] JAMES C. SPRY,
Executive Assistant to the Commissioners.

[FR Doc.72-4282 Filed 3-20-72; 8:49 am]

ENVIRONMENTAL PROTECTION AGENCY

MOTOR VEHICLE POLLUTION CONTROL

Suspension Request; Notice of Public Hearing; Procedures Therefor

Section 202(b) (5) (A) of the Clean Air Act, as amended, provides that at any time after January 1, 1972, any automobile manufacturer may file with the Administrator an application requesting the suspension for 1 year only of the effective date, with respect to that manufacturer, of the carbon monoxide or hydrocarbon (or both) emission standards applicable to light duty vehicles manufactured beginning with the model year 1975. Section 202(b) (5) (D) provides that the Administrator shall make his determination with respect to any such application within 60 days.

If the Administrator determines that such suspension should be granted, he shall simultaneously with such determination prescribe by regulation interim

emission standards which shall apply to emissions of carbon monoxide or hydrocarbons (or both) from such vehicles manufactured during model year 1975. Section 202(b) (5) (C) provides that such interim standards shall reflect the greatest degree of emission control which the Administrator determines is available, giving appropriate consideration to the cost of applying such technology within the period of time available to manufacturers.

Section 202(b) (5) (D) provides that the Administrator shall issue a decision granting such suspension after a public hearing and only if he determines that (1) such suspension is essential to the public interest or the public health and welfare of the United States, (2) all good faith efforts have been made to meet the established standards, (3) the applicant has established that effective control technology, processes, operating methods or other alternatives are not available or have not been available for a sufficient period of time to achieve compliance prior to the effective date of such standards, and (4) the study and investigation of the National Academy of Sciences and other information available to him have not indicated that technology, processes, or other alternatives are available to meet such standards.

On March 13, 1972, Volvo, Inc., filed with the Administrator an application for a 1-year suspension with respect to that company, of the effective date of the 1975 emission standards. A public hearing on this application will be held in Washington, D.C., commencing at 10 a.m. on April 10, 1972. A subsequent FEDERAL REGISTER notice will specify the location of the public hearing.

The public hearing is intended to provide an opportunity for interested persons to state their views or arguments, or to provide pertinent information concerning the action requested of the Administrator by the applicant. Any person desiring to make an oral statement at the hearing should file a notice of such intention and, if practicable, five copies of his proposed statement with the Director, Mobile Source Enforcement Division, Environmental Protection Agency, Room 3609, 401 M Street SW., Washington, DC 20460, not later than April 5, 1972. Written statements and information may be submitted to the Director, Mobile Source Enforcement Division, at the above address for inclusion in the record of the hearing at any time prior to completion of the hearing.

The hydrocarbon and carbon monoxide emission standards for model year 1975 light duty vehicles subject to suspension are contained in 40 CFR Part 85.21(a). The application and such portions of the applicant's supporting documentation as may properly be made public will be available for public inspection in the Office of Public Affairs, Environmental Protection Agency, Room 3241, 401 M Street SW., 20460. Any person may obtain copies of public portions of the applications as provided for by 40 CFR Part 2.

Procedures. Since the public hearing is designed to give all interested members of the public an opportunity to participate in this proceeding, participants may present data, views, arguments, or other pertinent information concerning the action requested of the Administrator and may submit written questions to be propounded to the applicant by the hearing panel to the extent practicable. Appropriate representatives of the applicant will be required to attend the hearing and respond to questions propounded by the hearing panel. Questions submitted by the public to be propounded to Volvo, Inc., must be received by the Director, Mobile Source Enforcement Division no later than April 5, 1972. The panel may limit the length of oral presentations, may exclude irrelevant or redundant material or questions, and may direct that corroborative material be submitted in writing rather than presented orally.

Presentations by participants shall be addressed exclusively to the following considerations:

1. Whether the requested suspension is essential to the public interest or the public health and welfare of the United States.
2. Whether the applicant has made all good faith efforts to meet the standard or standards for which suspension is sought.
3. Whether the applicant has shown that there is not available effective control technology, processes, operating methods, or other alternatives that would enable the applicant to achieve compliance prior to the effective date of such standards.
4. Whether the study conducted by the National Academy of Sciences and other information indicate that technology, processes, or other alternatives are available for any manufacturer to meet such standards.
5. What interim standards for the 1975 model year would reflect the greatest degree of emission control achievable by available technology, giving appropriate consideration to the cost of applying such technology within the period of time available to manufacturers.

A verbatim transcript of the proceeding will be made and copies will be available from the reporter at the expense of any person requesting them.

Dated: March 16, 1972.

WILLIAM D. RUCKELSHAUS,
Administrator.

[FR Doc.72-4337 Filed 3-20-72;8:51 am]

STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES Supplemental Statement in Connection With Final Promulgation

I. EPA published Standards of Performance for New Stationary Sources in final form, prefaced by a "concise general statement of their basis and pur-

pose" as required by section 4(c) of the Administrative Procedure Act, 5 U.S.C. 553(c), on December 23, 1971. 36 F.R. 24876. Petitions for review of certain of these standards were filed on January 21 and 24 by the Essex Chemical Corp. et al., the Portland Cement Association, and the Appalachian Power Co. et al. (U.S. Court of Appeals for the District of Columbia, Nos. 72-1072, 72-1073, and 72-1079).

On February 18, 1972, almost 2 months after EPA published the New Stationary Source Standards, the U.S. Court of Appeals for the District of Columbia Circuit handed down its decision in "Kennecott Copper Corp. v. Environmental Protection Agency" (C.A.D.C. No. 71-1410), which concerned a national secondary ambient air quality standard promulgated by EPA pursuant to section 109(b) of the Clean Air Amendments of 1970, 42 U.S.C. 1857C-4(b). The court there held that although the "concise general statement" prefacing the standard involved satisfied the requirements of section 4(c) of the Administrative Procedure Act, it would nonetheless remand the cause to the Administrator for a more specific explanation of how he had arrived at the standard.

In light of the decision in "Kennecott Copper," and in the interest of a speedy judicial determination of the validity of the Standards of Performance for New Stationary Sources, we have prepared this statement of the basis of the Administrator's decision to promulgate the standards to supplement that appearing as the preface to the final standards as published in December 1971. Although if the point were raised it might ultimately be determined that this statement was not necessary to satisfy the doctrine expressed by the "Kennecott Copper" opinion, EPA considers it fundamental to the national policy embodied in the Clean Air Amendments of 1970 to expedite all steps of promulgation and enforcement of standards and implementation plans to bring about clean air. The speedy eradication of any uncertainty as to the validity of the standards for new stationary sources is an important part of this process. Accordingly, considering the particular sequence of events and pressures of time involved here, we think it most appropriate to include this supplementary statement in the record now, thereby ensuring the rapid conclusion of judicial review of the validity of the standards.

II. 1. **The Particulate Test Method.** Particulate emission limits were proposed for steam generators, incinerators, and cement plants, based on measurements made with the full EPA sampling train, which includes a dry filter as well as impingers, which contain water and act as condensers and scrubbers. In the impingers the gases are cooled to about 70° F. before metering.

There were objections to the use of impingers in the EPA sampling train,

with suggestions that the particulate standards be based either on the "front half" (probe and filter) of the EPA sampling train or on the American Society of Mechanical Engineers test procedure. Both of these methods measure only those materials that are solids or liquids at 250° F. and greater temperatures.

It is the opinion of EPA engineers that particulate standards based either on the front half or the full EPA sampling train will require the same degree of control if appropriate limits are applied. Analyses by EPA show that the material collected in the impingers of the sampling train is usually although not in every case a consistent fraction of the total particulate loading. Nevertheless, there is some question that all of the material collected in the impingers would truly form particulates in the atmosphere under normal dispersion conditions. For instance, gaseous sulfur dioxide may be oxidized to a particulate form—sulfur trioxide and sulfuric acid—in the sampling train. Much of the material found in the impingers is sulfuric acid and sulfates. There has been only limited sampling with the full EPA train such that the occasional anomalies cannot be explained fully at this time. In any case, the front half of the EPA train is considered a more acceptable means of measuring filterable particulates than the ASME method in that a more efficient filter is required and the filter has far less mass than the principal ASME filter in relation to the sample collected. The latter position was reinforced by a recommendation of the Air Pollution Control Association.

Accordingly, we determined that, for the three affected source categories, steam generators, incinerators, and cement plants, particulate standards should be based on the front half of the EPA sampling train with mass emission limits adjusted as follows:

	Originally proposed particulate standards, full EPA train	Recommended particulate standards revised sample method (front half only)
Steam Generators—pounds per million Btu heat input.....	0.20	0.10
Incinerators—grains per standard cubic foot at 12 percent CO ₂	0.10	0.08
Cement Kilns—pounds per ton feed..	0.30	0.30
Cement Coolers—pounds per ton feed..	0.10	0.10

The adjusted standards are based on EPA sampling results and are designed to provide the same degree of control as the originally proposed standards. In the case of steam generators, the installations which were found to be best controlled showed reasonably large concentrations (about 50 percent) of materials in the impingers. The five incinerator

tests which showed compliance with the originally proposed standard all indicated impinger catches of 20 to 30 percent. All five of these tests indicate compliance with the original and the revised standard.

In the case of cement plants, holding to the same allowable emission rate while changing the sampling method results in a slight relaxation of the standard. This permits an electrostatic precipitator as well as a fabric filter to meet the emission standard.

2. *The Sulfur Dioxide Standard for Steam Generators of 1.2 Pounds Per Million B.T.U. Heat Input.* The Administrator took into account the following facts in determining that there has been adequate demonstration of the achievability of the standard.

There are at present three SO₂ removal systems in operation at U.S. power stations. Moreover, a total of 13 electric power companies have contracted for the construction of seventeen additional units, most of which will become operational in the next 2 years. Most of these employ lime or limestone scrubbing, but magnesium oxide and sodium hydroxide scrubbing and catalytic oxidation also will be used. In addition, seven units will be equipped with water scrubbers for fly ash collection in the anticipation that they may be converted to SO₂ removal in the future. Eight different firms are designing the installations. One of the installations, a sodium hydroxide scrubber, is guaranteed by the designer to achieve 90 percent or better SO₂ removal. Four others are guaranteed at 80 percent or better. Table I summarizes information about these installations. Generally, the standard of 1.2 pounds of sulfur dioxide per million B.t.u. input can be met by the removal of 70-75 percent of the sulfur dioxide formed in the burning of coal of average sulfur content (i.e., 2.3-3 percent).

A 125-megawatt unit now operated by the Kansas Power and Light Co. at Lawrence, Kans., was put into operation in December 1968. Several problems were experienced originally and appreciable revisions have been made to improve the system. The most successful operation of the scrubber has occurred during 1971.

In some respects the plant is atypical in that it is not required to burn coal continually. Natural gas is available much of the time, and the station also has a supply of fuel oil that can be burned in emergencies when natural gas is not available. Kansas Power and Light has used this flexibility to advantage in the operation of the scrubber. It frequently switches the unit from coal to natural gas, bypassing the scrubber, so that they can inspect the internals for possible malfunction. The generating unit was seldom operated longer than 4 weeks on coal firing without making such inspections. In most instances, little or no maintenance was required during the outage, and the company then merely inspected the scrubber.

TABLE I—SULFUR DIOXIDE REMOVAL SYSTEMS AT U.S. STEAM-ELECTRIC PLANTS

Power station	Unit size	Designer SO ₂ system	New or retrofit	Scheduled startup	Anticipated efficiency of SO ₂ removal
Limestone Scrubbing:					
1. Union Electric Co., Meramec No. 2.	140	Combustion Engineer.	R	September 1968....	Operated at 73% efficiency during EPA test.
2. Kansas Power & Light, Lawrence Station No. 4.	125	Combustion Engineer.	R	December 1968....	Do.
3. Kansas Power & Light, Lawrence Station No. 5.	430	Combustion Engineer.	N	December 1971....	Will start at 65% and be upgraded to 80%. Guaranteed 70%.
4. Kansas City Power & Light, Hawthorne Station No. 3.	100	Combustion Engineer.	R	Late 1972....	Do.
5. Kansas City Power & Light, Hawthorne, Station No. 4.	100	Combustion Engineer.	R	Late 1972....	Do.
6. Kansas City Power & Light, LaCygne Station.	800	Babcock & Wilcox....	N	Late 1972....	80% as target.
7. Detroit Edison Co., St. Clair Station No. 3.	180	Peabody.....	R	Late 1972....	90% as target.
8. Detroit Edison Co., River Rouge Station No. 1.	265	Peabody.....	R	Late 1972....	Do.
9. Commonwealth Edison Co., Will County Station No. 1.	175	Babcock & Wilcox....	R	February 1972....	Guaranteed 80%.
10. Northern States Power Co., Sherburne County Station, Minn., No. 1.	700	Combustion Engineer.	N	1976....	
11. Arizona Public Service, Cholla Station Co.	115	Research Cottrell....	R	December 1973....	
12. Tennessee Valley Authority, Widow's Creek Station No. 8.	550	Undecided.....	R	1974-75....	
13. Duquesne Light Co., Philips Station.	100	Chemico.....	R	March 1973....	Do.
14. Louisville Gas & Electric Co., Paddy's Run Station.	70	Combustion Engineer.	R	Mid-late 1972....	Do.
15. City of Key West, Stock Island. ¹	37	Zurn.....	N	Early 1972....	Guaranteed 80% removal.
16. Union Electric Co., Meramec No. 1.	125	Combustion Engineer.	R	Spring 1973....	80% as target.
Sodium Hydroxide Scrubbing Installations:					
1. Nevada Power Co., Reed Gardner Station.	250	Combustion Equipment Associates.	R	1973....	Guaranteed 90% SO ₂ while burning 1% S coal.
Magnesium Oxide Scrubbing Installations:					
1. Boston Edison Co., Mystic Station No. 6. ²	150	Chemico.....	R	February 1972....	90% target.
2. Potomac Electric Power, Dickerson No. 3.	195	do.....	R	Early 1974....	90%.
Catalytic Oxidation:					
1. Illinois Power, Wood River. ²	100	Monsanto.....	R	June 1972....	Guaranteed 80% SO ₂ removal.

¹ Oil-fired plants (remainder are coal-fired).
² Partial EPA funding.

All water from the pond is recycled back to the scrubber. Blowdown from cooling towers constitutes makeup water. The sludge oxidizes to sulfate in the pond. Eventually, sulfate may be removed from the system and taken with the ash to landfills.

The limestone system for the new 430-megawatt steam-electric unit at the Lawrence station is essentially the same as the smaller unit. It has been operated only on a limited basis to date. The company plans to operate at 65 percent SO₂ removal, then upgrade to 80 percent or more based on experience with the 125-megawatt unit. With the new system sulfate crystallization will be accomplished in tanks. The company plans to run clarified liquor from the crystallizers directly back to the scrubbers. A solids content of 6-10 percent will be maintained in the recycle liquor to prevent scaling in exposed surfaces.

Combustion engineering pilot studies. Pilot studies conducted by the Combustion Engineering Co. on a 1 mw. equivalent stream showed 95 percent SO₂ removal with continuous crystallization and 100 percent water recycle from crystallizers. The studies form the basis upon

which CE is guaranteeing that its new installations will remove at least 70 percent of SO₂.

Battersea scrubber. The principle of alkaline scrubbing has been demonstrated at the Battersea Power Station in England, where a scrubber has been in use since 1932. A multiple stage process is employed. Alkaline river water is used in the first stage and lime-neutralized liquor in subsequent stages. The steam generator is of 3,500 million B.t.u. rating. Reports indicate that the efficiency of this system exceeds 90 percent when the boiler is fired with 0.8 to 1 percent sulfur coal. Similar systems are in operation on two 150-mw. oil-fired boilers at the Bankside Power Station in England.

Swansea scrubber. Lime scrubbing processes were installed on coal-fired units at the Swansea Power Station and the Fulham Power Station in England prior to World War II. The system at the Fulham Station reportedly operated successfully until shut down for security reasons early during World War II. It was not reactivated after the war. The Swansea installation was operated for about 2 years on a coal-fired power boiler

and is not now in service. Unlike the Battersea and Banks operations, these units utilized a continuous liquid recycle. The systems were reported to operate at SO₂ efficiencies of 90 percent or greater.

Bahco lime scrubbing. The two-stage system has been demonstrated at about 98 percent SO₂ removal over a 6-month period on a 7-mw. oil-fired steam generator in Sweden. The process is now being offered under license in the United States by Research Cottrell. None of the Bahco systems have yet been installed on coal-fired boilers. Nevertheless, the two-stage scheme appears to offer definite advantages over single-stage processes in achieving high removal efficiencies.

Wellman power gas sulfite scrubbing. The sulfite-bisulfite system has been installed on two oil-fired boilers in Japan. The combined capacity is about 650 million B.t.u. per hour. Since it was put into operation in June 1971, removal efficiencies of 95 percent have been reported with exit levels of about 0.2 pounds SO₂ per million B.t.u. The system has not been operated on a coal-fired boiler. However, since precipitators have been shown to remove particulates down to the same level as oil-fired units, application of the sulfite system to coal-fired boilers should be feasible.

A principal difficulty in operating lime based scrubbing systems has been the tendency to form scale on scrubber surfaces. Union Electric, TVA, and to a lesser extent Kansas Power and Light have reported scaling problems. The experience of Kansas Power and Light and European and Japanese installations show that scaling can be held to a tolerable level. Present designs probably will be revised to optimize cost versus scaling. The use of two or more stages would appear desirable for high sulfur coals.

In all probability, there will be some scale formation in all closed circuit lime scrubbing systems for SO₂ abatement. At the Bahco installation as at the Kansas Power and Light installation in the United States, this is minimized by keeping the solution pH in the acid region. In addition to this, a Mitsubishi Heavy Industries pilot plant in Japan has employed seed crystals and a delay tank and was reportedly able to operate for 500 hours without any sign of scaling (i.e., the scaling took place on the seed crystals).

In addition to operating at an acid pH, the Bahco system employs a wide open scrubber that can tolerate appreciable scale deposits. It was reported that the installation of additional spray heads to more thoroughly wash the wetted surfaces at the Bischoff installation in West Germany helped to prevent scale formations.

All three installations cited above have reported successful periods of operation while employing the above-mentioned techniques. The most successful of these is the Bahco unit which has had no serious operational difficulties since November 1969. These examples show that lime systems can be operated without unscheduled shutdown due to scale problems.

3. **Cost of compliance with steam generator standards.** The economic impact of the new source performance standards and requisite pollution control expenditures have been developed for a typical new coal-fired unit of 600-megawatt (MW) capacity. The investment cost for such a plant would be \$120 million plus \$18 million for sulfur dioxide and particulate control and \$1 million for nitrogen oxide control. The \$19 million total can be compared to \$3.6 million which would have been expended for particulate control if sulfur dioxide and nitrogen oxide abatement were not required.

On an annualized basis the pollution control costs would be 0.13 cents per kw.-hr. for sulfur dioxide and particulate control plus 0.01 cents per kw.-hr. for nitrogen oxide control. Particulate control alone would cost 0.01 cents per kw.-hr. An average revenue of 1.56 cents per kw.-hr. is assumed. Based on these figures, the cost of pollution control will be about 9 percent of the delivered cost of electricity if all plants operated by the utility in question had to incur a comparable cost. Using a figure of \$130 per year as the average residential electric bill, the increased cost of electricity to a residential customer would be about \$1 per month if the total cost of control is passed on to the customer.

An indication of the impact of increased electricity cost on industrial consumers may be obtained by examining the relationship of electricity cost to production costs. An upper limit may be approximated by considering the aluminum industry, a large consumer of electrical energy. If the aluminum industry were to incur an increase of nine percent in electricity cost, production costs would increase by about 1.4 percent. Although aluminum smelters usually consume hydroelectric power and would not realize pollution control costs increases, nonetheless, the figures show that even for a large consumer the impact of increased electricity cost is fairly small. In general, the estimated electricity cost increase will have only a minor impact on production costs.

Each year the power industry puts into operation about 49 new steam-electric units. On the average, 29 are fired with coal, seven with oil, and 13 with natural gas. Most of the oil-fired units and a few of the coal-fired units may burn low sulfur fuel. The number requiring flue gas desulfurization is estimated to be between 20 and 30 per year. Most of these, 15 to 20, will be located east of the Mississippi River.

The foregoing cost projections are based on estimated costs of \$30 per installed kilowatt for sulfur dioxide scrubbing systems which will also be capable of controlling coal particulate to the level of the standard. Some power distributors have questioned the figure and suggest that the actual cost may be close to \$70 per kw. Nevertheless, a review of applicable cost estimates for calcium base SO₂ scrubbing system shows support for the EPA estimate.

The four estimates listed in table II for new plants range from \$18.7 to \$25.67

per kw. Three of the plants are large—680 to 1,000 mw. All five estimates for retrofitting existing plants show greater cost, ranging from \$28.6 to \$61.8 per kw. The retrofit estimates tend to cover smaller steam generators, only one of the five being greater than 180 mw. In addition, the retrofit costs tend to reflect unusual circumstances which would not be expected at new plants. All are closed circuit limestone or calcium hydroxide systems except for the small unit at Key West, Fla. In the closed circuit system, all waters are recycled to avoid problems of liquid and solid waste disposal.

TABLE II

COST ESTIMATES FOR EQUIPPING COAL FIRED STEAM-ELECTRIC PLANTS WITH CALCIUM BASE SCRUBBING SYSTEMS (1971 ESTIMATES)

Source of estimate	Size	Capital cost
Zurn Industries (Key West installation).	37 MW (New)	\$20.4/kw.
Northern States Power Co.	2-680 MW (New)	\$18.7/kw.
Babcock & Wilcox (Hypothetical plant in mid-west).	800 MW (New)	\$25.67/kw.
Tennessee Valley Authority.	1000 MW (New)	\$19.20/kw.
Do.	550 MW (Retrofit)	\$54.5 to \$61.8/kw.
Louisville Gas & Electric Co.	70 MW (Retrofit)	\$28.6/kw.
Duquesne Light Co.	100 MW (Retrofit)	\$35/kw.
Commonwealth Edison Co.	175 MW (Retrofit)	\$40/kw.
Detroit Edison Co.	4-180 MW (Retrofit)	\$49.6/kw.

Projected capital costs for nitrogen control will range from nil to \$3.50 per kw. The greatest cost will be incurred from those units which will use combinations of flue gas recirculation and off-stoichiometric combustion to achieve the standard. Many of these will be gas-fired boilers which will not have to expend any capital for sulfur dioxide or particulate control. The least cost will be for corner-fired coal burning boilers which should be able to meet the standards without any modification. Corner-fired units are sold by only one of the four major U.S. power boiler manufacturers. The other three firms have experience with nitrogen oxide reduction schemes for gas and oil burning but it is uncertain what methods they will employ with coal burning. Consequently, precise costs are uncertain, but it is expected that the nitrogen oxide standard will stimulate interest in combustion techniques which can achieve the required emission levels at little or no increase in cost.

4. **The nitrogen oxide standard for coal-fired steam generators.** The standards set an emission limit of 0.7 pound of nitrogen oxide per million B.t.u. coal-fired steam generators. This is roughly equivalent to a stack gas concentration of 550 parts per million for a bituminous-fired operation. Several electric utilities and three of the four major boiler manufacturers commented that the technology was not fully demonstrated to achieve the standard.

The coal standard is based principally on nitrogen oxide levels achieved with corner-fired boilers which are manufactured by only one company—Combustion Engineering. This firm has confirmed in writing that it will guarantee to meet the nitrogen oxide standard. Investigations by an EPA contractor showed that other types of boilers could meet the standard under modified burning conditions. In fact, two of the three remaining companies have informed EPA they will guarantee that their new installations will meet the EPA standard of 0.7 pound/million B.t.u. on new installations.

5. *Particulate standards for kilns in portland cement plants.* Particulate emission limits of 0.3 pound per ton of feed to the kiln were proposed for cement kilns. This is roughly equivalent to a stack gas concentration of 0.03 grains per standard cubic foot.

The Portland Cement Association, American Mining Congress, a local control agency and the major cement producers commented that the kiln standard was either too strict or it is not based on adequately demonstrated technology, i.e. fabric filters can not be used for all types of cement plants. On the other hand, a comment was received from an equipment manufacturer stating that equipment other than fabric filters also can be used to meet the standard and citing supportive data for electrostatic precipitators. In addition, the AMC, a local agency and cement producers commented that the particulate standards for cement kilns are stricter than those promulgated for power plants and municipal incinerators. Further they objected to the test method to be used to determine compliance.

The proposed standard was based principally on particulate levels achieved at a kiln controlled by a fabric filter. Several other kilns controlled by fabric filters had no visible emissions but could not be tested due to the physical layout of the equipment. After proposal, but prior to promulgation a second kiln controlled by a fabric filter was tested and found to have particulate emissions in excess of the proposed standard. However, based on the revised particulate test method, the second installation showed particulate emissions to be less than 0.3 pound per ton of kiln feed.

The promulgated standard is roughly equivalent to a stack gas concentration of 0.03 grains per standard cubic foot. The power plant standard is equivalent to 0.06 grains per standard cubic foot at normal excess air rates. The incinerators standard is 0.08 grains per standard cubic foot corrected to 12 percent carbon dioxide. Uncorrected, at normal conditions of 7.5 percent carbon dioxide it is equivalent to 0.05 grains per standard cubic foot. The difference between the particulate standard for cement plants and those for steam generators and incinerators is attributable to the superior technology available therefor (that is, fabric

filter technology has not been applied to coal-fired steam generators or incinerators).

In sum, considering the revision of the particulate test method, there are sufficient data to indicate that cement plants equipped with fabric filters and precipitators can meet the standard.

6. *Cost of achieving particulate standard for kilns at portland cement plants.* A limit of 0.3 pounds per ton of feed to the kiln was proposed. The limit applies to all new wet or dry process cement kilns.

Three cement producers commented that a well-controlled plant would cost much more than indicated by EPA. A meeting between American Mining Congress and EPA revealed that that association felt the cost of an uncontrolled cement plant as reported by EPA was low by a factor of 1.5 to 2. However, the association agreed that EPA had accurately estimated the cost of the pollution control equipment itself. Accordingly, no change in the standard was warranted on account of cost. Indeed, if the industry is correct in asserting that the cost of an uncontrolled plant is higher than that estimated by EPA, that means that the cost of pollution control expressed as a percentage of total cost is less than the 12 percent figure cited in the background document, APTD-0711, which was distributed by EPA at the time the standards were proposed.

7. *Sulfur dioxide and acid mist standards for sulfuric acid plants.* Sulfur dioxide emission limits of 4 pounds per ton of acid produced and acid mist emission limits of 0.15 pounds per ton of acid produced were proposed for sulfuric acid plants.

Several sulfuric acid manufacturers and the Manufacturing Chemists Association commented that the proposed SO_2 standard is unattainable in day-to-day operation at one of the plants tested or that it is unduly restrictive. They asserted that to meet the standard, the plant would have to be "designed to 2 pounds per ton" to allow for the inevitable gradual loss of conversion efficiency during a period of operation, and that units capable of such performance have not been demonstrated in this country. Essentially, the same parties commented that there is published data showing that due to the vapor pressure of sulfuric acid, the acid mist standard is not attainable.

The proposed standard was based principally on sulfur dioxide levels achieved with dual absorption acid plants and one single absorption plant controlling emissions with a sodium sulfite SO_2 recovery system. There are only three dual absorption plants in this country. Company emission data at one of the plants tested indicates the plant was meeting the proposed standard for a year of operation when the production rate was less than 600 tons per day. The plant is rated at 700 tons per day. At the second U.S. plant, emissions were about 2 pounds per ton about two months after startup. Dis-

cussion with foreign dual absorption plant designers and operators indicates normal operation at 99.8 percent conversion or higher for 99 percent of the time over a period of years. This conversion efficiency is equivalent to approximately 2.5 pounds per ton of acid produced.

Complaints from the industry that it cannot meet the acid mist standard appear to be based on experience with other test methods than EPA's. Such other methods measure more sulfur trioxide and acid vapor, in addition to acid mist, than does the EPA method. Tests of several plants with the EPA test method have shown acid mist emissions well below the emission limits as set in the standards.

8. *Cost of achieving sulfur dioxide standard at sulfuric acid plants.* A limit of 4 pounds of sulfur dioxide per ton of acid produced is set by the regulation. The limit applies to all types of new contact acid plants except those operated for control purposes, as at smelters.

The sulfuric acid industry has commented that (1) the cost of achieving the proposed sulfur dioxide standard is about three times the EPA estimate, and (2) promulgation of a standard 60 percent less restrictive than proposed by EPA would reduce the control cost 47 percent.

In developing the parallel cost estimates, both the industry and EPA assume the dual absorption process will be used to control sulfur burning plants and many spent acid plants. The more costly Wellman-Power Gas sulfite scrubbing system will be used with plants which process the most contaminated spent acid feedstocks where capital investment historically is 80 percent greater than sulfur burning plants. The Wellman-Power Gas process would also be used for retrofitting existing plants where appropriate. Both the dual absorption and Wellman-Power Gas processes have been demonstrated on commercial installations. Seventy-six dual absorption plants have been constructed or designed since the first in 1964. Only three, however, are located in this country. One sulfite scrubbing process is now in operation in the United States and four more will be put into service in 1972. All are retrofit installations. Two other such scrubbers are being operated in Japan. These seven installations consist of three acid plants, two Claus sulfur recovery plants, an oil-fired boiler, and a kraft pulp mill boiler.

Control costs. EPA engineers have reviewed the industry analysis and find no reason to change their original cost estimate. As summarized in Table III, EPA estimates that the cost of achieving the standard is \$1.07 to \$1.32 per ton of acid for dual absorption systems and \$3.50 per ton for sulfite scrubbing systems. The industry estimate for a sulfur burning dual absorption plant is \$2.31 greater than EPA's. We believe the industry's estimate to be excessive for the following reasons.

TABLE III

ESTIMATED COSTS OF CONTROLLING SULFUR DIOXIDE FROM CONTACT SULFURIC ACID PLANTS

	Dual absorption process		Sodium sulfite scrubbing	
	In- dustry	EPA	In- dustry	EPA
Sulfur burning plants:				
Direct Investment (Thousands of \$)...	2,000	550	Not anticipated for new sulfur burning plants.	
Total Added Cost (\$/Ton) ^a	3.33	1.07		
Spent acid plants:				
Direct Investment (Thousands of \$)...	3,100	900	2,200	2,300
Total Added Cost (\$/Ton) ^a	4.45	1.32	4.11	3.50

^a Total added cost includes depreciation, taxes, 16% return on investment after taxes and other allocated costs.

Seventy-two percent of the difference between the Du Pont and EPA estimates is due to direct investment, plant overhead, and operating costs for auxiliary process and storage equipment which Du Pont predicts will be necessary to satisfy the standards. EPA does not believe that such auxiliary equipment will be necessary in practice to meet the standard.

Twenty percent of the difference is due to differences in estimates of the cost and consumption of utilities. Elimination of auxiliary equipment referred to above reduces the consumption rate of both electricity and steam. Eight percent results from the industry's apportionment of "other allocated costs" (Corporate Administration, i.e., sales, research, and development, main office, etc.) in proportion to their estimate of the additional investment required for control. Although an accepted procedure for internal cost accounting, this does not represent a true out-of-pocket cost.

In sum, the EPA analysis shows that meeting the proposed standard with a dual absorption plant requires a substantial investment over an uncontrolled plant but only 30 percent as great as indicated by the industry. Moreover, relaxation of the proposed standard by 60 percent (to the level recommended by the industry) would decrease the cost of control in dual absorption plants only 10 to 15 percent. For sulfur burning plants the cost differential would be \$0.10 per ton of acid. For spent acid plants, it would be \$0.17.

Economic impact of proposed standard. Most sulfuric acid production is captive to large vertically integrated chemical, petroleum, or fertilizer manufacturers. An increasing volume of production also results from the recovery of sulfur dioxide from stack gases or the regeneration of spent acid instead of its discharge into streams.

Depending on the abatement process selected and the plant size, the direct investment for control can range from 14 to 38 percent of the investment in an uncontrolled acid plant.

The added cost of air pollution control, coupled with the inherent market disadvantage of the small manufacturer, may make future construction of plants

of less than 500 tons per day economically unattractive except as a sulfur recovery system for another manufacturing process.

It is estimated that the average market price will increase by \$1.07 per ton reflecting the lower end of the cost range. This represents a small increase in the \$31 per ton market price and will have little effect on the demand for acid.

The increasing production of recovered and regenerated acid, as a result of abatement efforts, will inhibit the growth of conventional acid production and threaten eventually to displace much of that production.

WILLIAM D. RUCKELSHAUS,
Administrator.

MARCH 16, 1972.

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FEDERAL MARITIME COMMISSION

CERTIFICATES OF FINANCIAL RESPONSIBILITY (OIL POLLUTION)

Notice of Certificates Revoked

Notice of voluntary revocation is hereby given with respect to Certificates of Financial Responsibility (Oil Pollution) which had been issued by the Federal Maritime Commission, covering the below-indicated vessels, pursuant to Part 542 of Title 46 CFR and section 11(p) (1) of the Federal Water Pollution Control Act, as amended.

Certificate No.	Owner/operator and vessels
01039---	Den Norske Amerikaline A/S (Norwegian America Line): Kongsfjord.
01049---	Delos Maritime Co., Ltd.: Black Knight.
01065---	Reederei Richard Schroder: Erich Schroder.
01071---	Kommanditselskabet AF 19. August 1968 (Komplementar: P.F.S. Heering): Heering Kirse.
01075---	Valdemar Skogland A/S: Notos.
01107---	N.V. Stoomvaart-Maatschappij "Oostzee" (Curacao) (Steamship Co. "Oostzee" (Curacao), Ltd.: Poinciana.
01108---	Hvalfangeraktieselskabet "Ross-havet" & "Vestfold" (Ross-havet) Whaling Co., Ltd. & "Vestfold" Whaling Co., Ltd.: Ross Lake.
01155---	Ernst Jacob, Reeder und Schiffsmakler: Steinhoff.
01318---	Aug. Nolten, Wm. Miller's Nachfolger: Bell Volunteer.
01323---	Manchester Liners, Ltd.: Manchester Port. Manchester Progress. Manchester City. Manchester Renown.
01334---	American President Lines, Ltd.: President Polk.
01413---	Kinyras Shipping Co., Ltd., of Nicosia, Cyprus: Paphos.
01454---	Hunting (Eden) Tankers, Ltd.: Gretafield.
01481---	Chios Shipping Co., Ltd.: Chios.
01517---	Salamis A/S: Stolt Skaukar.
01530---	Herm. Dauelsberg, Bremen: Bellavia. Silvia.
01627---	Atlantic Oil Carriers, Ltd.: Eugenie Livanos.
01714---	Ellos S.p.A.-Palermo: Penelope.
01759---	Morania Compania Naviera S.A.: Etolis.
01815---	Aug.-Thyssenhutte A.G., Duisburg, as Bareboat Chartered Owners: Francesca.
01844---	Nationale Tankvaart Maatschappij N.V.: Forest Hill.
01861---	BP Tanker Co., Ltd.: British Sportsman. British Guardian. British Engineer. British Fame.
01919---	Aksjeselskabet Pelagos: Pontia.
01935---	Interessentskab Mellem Aktieselskabet Dampskibsselskabet Svendborg & Damp ... AF 1912 Aktieselskabet: Caroline Maersk.
01985---	Aktiebolaget Svenska Atlant Linien: Sagaholm. Odensholm.
01986---	Aktiebolaget Transmarin: Astrid.
01988---	Angfartygsaktiebolaget Tirfing: Atland.
02016---	A. L. Mechling Barge Lines, Inc.: MBL-18T. JIH 14. JIH 16.
02043---	Suomen Tankkilaiva oy Finska Tankfartygs AB: Wisa.
02069---	World Dale Corp.: World Dale.
02093---	Thor Tanker Corp.: World Majesty.
02094---	Lysander Shipping Co.: World Memory.
02095---	Urania Tanker Corp.: World Merchant.
02131---	Houlder Line, Ltd.: Oswestry Grange.
02132---	South American Saint Line, Ltd.: St. Merriel.
02138---	Sioux City & New Orleans Barge Lines, Inc.: Ellis 1301. Ellis 1302. Ellis 1303. UMI 1250. UMI 1251.
02163---	Rederiet "Ocean" A/S, Copenhagen: Roman Reeder.
02181---	James L. Bryan: BBC-2002. BBC-2001.
02194---	Compagnie Generale Transatlantique: Carimare.
02202---	Humble Oil & Refining Co.: Esso 15.
02264---	Dr. Erich Retzlaff: Renate Retzlaff. Emma Retzlaff. Indal Retzlaff.
02270---	Enso-Gutzeit Osakeyhtio: Finnhawk. Finneagle. Finnarrow.